Commentary

An International Look at School-Based Children's Dental Services

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Abstract: School-based dental clinics, when well-managed, can bring good quality care to children where they normally congregate, thus avoiding many of the problems found where children must be taken to private offices out of school hours. Both capital and running expenses for primary care can be substantially reduced.

Utilization figures for school-based dental services now reach 98 per cent of eligible children in New Zealand, where dental nurses do simple operative dentistry including cavity preparation and fillings. Australia, where a modified New Zealand plan has been expanding for about 12 years, is moving rapidly to attain similar utilization. In Sweden, 95 per cent of the school-age population is reported to receive school-managed dental service through a government program. In the United States, however, it is commonly reported that less than one-half the school-age population receives good periodic dental care. (Am. J. Public Health 68:664–668, 1978.)

With dental care of the best quality in the world available to the children of the United States, but less well-distributed than in a number of other countries, it becomes important to look at some of the problems that may underlie this situation.

It is commonly reported that less than one-half the children of the United States receive comprehensive periodic dental care of the type recommended by the American Dental Association, though 58.8 per cent of the child popuation 5–14 years old made at least one visit to the dentist in 1969.[1] Even in such a well-served state as California the proportion receiving comprehensive care does not appear to go above 60 per cent.[2] In contrast, 98 per cent of the children 5 to 13 years of age and 64 per cent of the preschool population in New Zealand are reported to be receiving periodic dental care at the hands of dental nurses.* In Australia, a modified New Zealand program started in 1966 is working rapidly toward a similar goal. In Sweden, virtually the entire child population receives government-managed dental care at the hands of dentists.[3] The quality of care in these different areas has uniformly been reported good, and in New Zealand particularly, has been subjected to very careful appraisal.[2, 4, 5]

The contrast between the United States and these other countries in utilization of children's dental care appears to lie to a large extent in the fact that good quality dental care has been brought to the children where they are normally congregated: i.e., in the public school system. In the United States school-based clinics are infrequent, poorly financed, poorly equipped for the most part, and looked down upon as part of a national philosophy which places the work of the private sector above that of any government service. The overwhelming majority of American children at all income levels must therefore be transported to private dental offices, usually during school hours, and often to dentists who are reluctant to accept Medicaid reimbursement (even where available) because of the business and cultural difficulties involved in treating low-income patients. With this in mind, the Advisory Committee on Dental Health to the U.S. Department of Health, Education, and Welfare[6] has recommended careful study and evaluation of all aspects of a school-based children's dental care program.

There is no doubt that the private practice of dentistry permits dentists to provide care on their own terms. The public must come to them where they choose to work. Quite naturally they have concentrated their offices in or near urban centers, particularly in the more affluent districts and suburbs of our cities. This system places the residents of the low-income areas of the inner cities and of all rural areas at a serious disadvantage: transportation is more difficult, and

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*Personal communication from R. K. Logan, Director, Division of Dental Health, New Zealand Department of Health, Wellington, June 3, 1977.

where working parents must accompany children, time off the job is increased without opportunity for reimbursement. Cultural barriers sometimes exist as well when low-income people feel that teeth are going to be lost anyhow, and that the professional attitudes of health providers from a culture different from their own are cold.[7]

If comprehensive care is to be brought to low-income populations where they are located, there are obviously two principal ways in which this could be done. One is by a neighborhood health center run either by a health department or a private agency;[8,9] the other is by a school-based clinic. School-based clinics built upon school premises, are sometimes paid for by the school department, sometimes by the department of public health. There are a number of administrative and other differences between school-based clinics and neighborhood health centers.

Dental Services in Australia, New Zealand, and Sweden

Some of the purest examples of school-based dental service are to be found in Australia and New Zealand. One of the authors (JMD) has made two trips to this part of the world. The first trip in 1972 provided some initial description of the deployment and control of dental auxiliaries in these clinics.[10] The second trip was made in 1977 by both of us. During the five-year interval between the two trips, significant advances had occurred in both countries.

In Australia, a Federal Labor Government had been in office for almost three years, from December 1972 to November 1975, and had provided large sums of money for expenditures by the States on a wide range of health care programs. Public dental service developed almost entirely through the increase of school-based services for children, with regional dental officers in charge of eight to ten dental therapists each. Thus in South Australia, where only 20 clinics had existed in 1972, in a state of under two million population, 69 were found in 1977.‡ Where one school for training the therapists had existed, there were now two schools. In New South Wales, where no therapist schools had been started in 1972, four schools were in operation in 1977, although the construction of new clinics in which the therapists could work had been badly hampered by the removal from power of the Labor government in November 1975. In Victoria, another state where therapists had not been previously authorized, a new school for therapists was about to graduate its first class.

All of these Australian therapists were destined ultimately to go singly or in pairs into school-based clinics distributed throughout the various states according to population needs. Dentists were to make initial examinations of school children and repeat these examinations at intervals not greater than two years, but the intervening examinations as well as simple operative dentistry including cavity preparation were to be performed by the therapists. The regional dental officer had a chair in the central clinic for each region and performed operative tasks for children whose problems were beyond the usual range of the therapist. The therapists for the most part were under general supervision rather than direct supervision. This gave them a responsible contact with their patients and full-time membership in the staffs of the schools where they were located. They had opportunities for classroom teaching and also for joining with the teachers in coaching sports and in a variety of other school activities that placed them in close, continuous contact with the children they were serving. The job satisfaction involved in this sort of work was such that their career life appeared to be eight years on the average in South Australia and only slightly less in Tasmania. Under these circumstances, public dental care was able to compete favorably with private dental care in terms of cost.

The Australian Dental Association, through its South Australian Branch,[11] expressed itself in 1976 as in support of school dental service as "a vital element of community health services" and also in favor of the establishment of a "dental team" approach to the practice of dentistry. It expressed the concern of some members of the dental profession as to the "viability of their . . . practices," which might be threatened by the establishment of school-based clinics. This type of comment came chiefly from dentists outside the metropolitan areas. The Association admitted, however, that it "found no evidence to suggest that the school dental service operations have had a major role in causing the abandonment of any country dental practices to date." On the contrary, the Department of Public Health reports that a considerable growth in private dental practice outside metropolitan Adelaide has occurred in the nearly eight years since the first of 34 school dental clinics opened there.‡

In New Zealand, where in 1971 the dental nurse plan had passed its half-century mark, utilization of children's dental services was approaching 98 per cent and the child population was virtually all on half-yearly maintenance status.* The Department of Public Health was no longer seeking to expand its nurse corps and was actually cutting down the number of new dental nurses to be graduated each year from their three training schools. In 1972 a corps of 1350 nurses could be maintained by the graduation of 200 new nurses per year. In 1977 that number had dropped to 120. The corps of nurses on duty still numbered 1,300. This change appeared to result from an increase in job satisfaction leading to increased career life. New Zealand nurses on the average were now spending almost 11 years apiece in service, many of them coming back to work after their children were old enough to be in school or away from home.

In New Zealand (as also in Australia and to some extent in the United States) water fluoridation had become increasingly common in the larger cities. In spite of this, the New Zealand dental profession was not expressing concern over "loss of business" among the child population. The New Zealand dentists were obviously adjusting their practices to

‡Personal communication from H. D. Kennare, Director, Dental Health Branch, South Australia Department of Public Health, Adelaide, S.A., June 9, 1977.

*Personal communication from R. K. Logan, op.cit.

meet the larger dental needs of adults, who were now beginning to keep their teeth for longer periods of time than they had some years ago. New Zealand had been noted as an area where dental caries was very high and where loss of teeth often required full denture prosthesis as early as age 20. The public, moreover, shared a tradition, apparently quite common in Great Britain, to the effect that teeth affected by either caries or periodontal disease should be extracted rather than saved.[12] The recent attainment of almost 100 per cent utilization of the school dental service in New Zealand is producing a new generation of young people who are keeping their teeth longer, and who will need increasing dental care in their adult life because they will not become full denture cases at such an early age. The carefully planned transitional adolescent plan in effect in New Zealand for children above age 13 has produced greater utilization of private practice than has been recorded elsewhere. Ninety-four per cent of a sampling of children at age 15 could still be listed as having had regular treatment throughout life by a dentist and school nurse or by a dentist alone according to a study made in 1968.[13]

In Sweden, children's dental care takes place chiefly in district dental health clinics, at or within ten kilometers of the schools. Busing occurs where necessary. The system is school-based in that the schools appear to take full responsibility for recall schedules, which are arranged within school hours for children of school age (7–16 years). Utilization rates for the whole country are 51 per cent at ages 3 to 5, 77 per cent at age 6, 95 per cent at ages 7 to 16, and 38 per cent at ages 17 to 19.**

Costs

Quite aside from the utilization of public dental services by the child population and the resulting changes in the nature of private practice, the question of cost per child per year must inevitably be considered. Our best figures come from New Zealand.* The Department of Public Health there compares its own cost per child in operating the dental nurse program in school-based clinics with the sums they pay to private dentists for adolescent care for children ages 13 to 18 for a similar scope of service. In 1975–76 the school dental service cost them $16.92 ($23.30, U.S.) per child per year between the ages of two and one-half and 13 years. For adolescents, 13 to 18 years of age, during the same period, they paid $25.00 per year ($34.40, U.S.). The costs of personnel training have been excluded from both of these estimates. The number of operations per case per year in the two age groups are approximately equal, though the number may perhaps be slightly larger for the adolescents.

In Australia the contrast is not quite so great. The South Australian School Dental Service has informed us that in 1975, the cost per child per year up to age 15 was $47.00 Australian ($54.50, U.S.).‡ This figure is to be contrasted with $49.00 Australian if similar operations had been provided on a fee-for-service basis by private dentists. The cost for training replacement therapists at current attrition rates (a career life of eight years) has been included in the $47.00 figure; the cost of training dentists has not been included in the $49.00 figure. The school dental service, using a combination of dentists and therapists, is felt to be economically competitive with private practice whenever the therapists stayed with their jobs three or more years.

Cost-benefit analyses in the United States give the advantage sometimes to child dental care in neighborhood health center clinics and sometimes to care in private dental offices,[14, 15] with the balance swinging one way or the other according to the scope of services provided and the specific items included in the cost figures. Specifically, a neighborhood health center cannot compete with private practice in Medicaid reimbursements if it provides health education and other non-reimbursable services—but can compete if it does not. In Australia, New Zealand, and America such differences in cost seem secondary to the logistic problems involved in obtaining a high proportion of utilization for childrens' dental services. The cost of adult dentistry for neglected groups has been shown on occasion to be as much as five times the annual cost of maintenance care.[16]

Equipment

An important factor in the high cost of dental care in the United States is the high overhead involved in setting up a private dental office. The salespersons of dental equipment, needless to say, urge young dental graduates to obtain only "the best" new equipment. Costs frequently run as high as $40,000 for setting up a new office.‡‡ A dental chair alone now costs approximately $3,000. Government dental services, however, can be less bound by style competition and may therefore purchase much simpler dental equipment, at the same time paying a smaller unit cost because of the possibility of large-scale purchase. Thus the New Zealand Department of Health now has a comprehensive equipment development program nearing completion.*** The broad principles behind this program are to provide inexpensive modern equipment suitable for two-handed dentistry. The equipment will be of local manufacture with some imported components, and is designed to be functional, easy to maintain, and pleasing to the patient (note contrast between old and new dental equipment in photos). It is expected that each operating position will be equipped for less than $3,500. This figure might be compared to one-half the cost of setting up a new private dental office, where the costs in New Zealand including space, renovation, etc., frequently run as high as $50,000 ($69,000, U.S.).*

**Personal communication from L-E. Granath, Professor and Dean, Lunds Universitet Odontologiska Fakulteten, September 15, 1977.

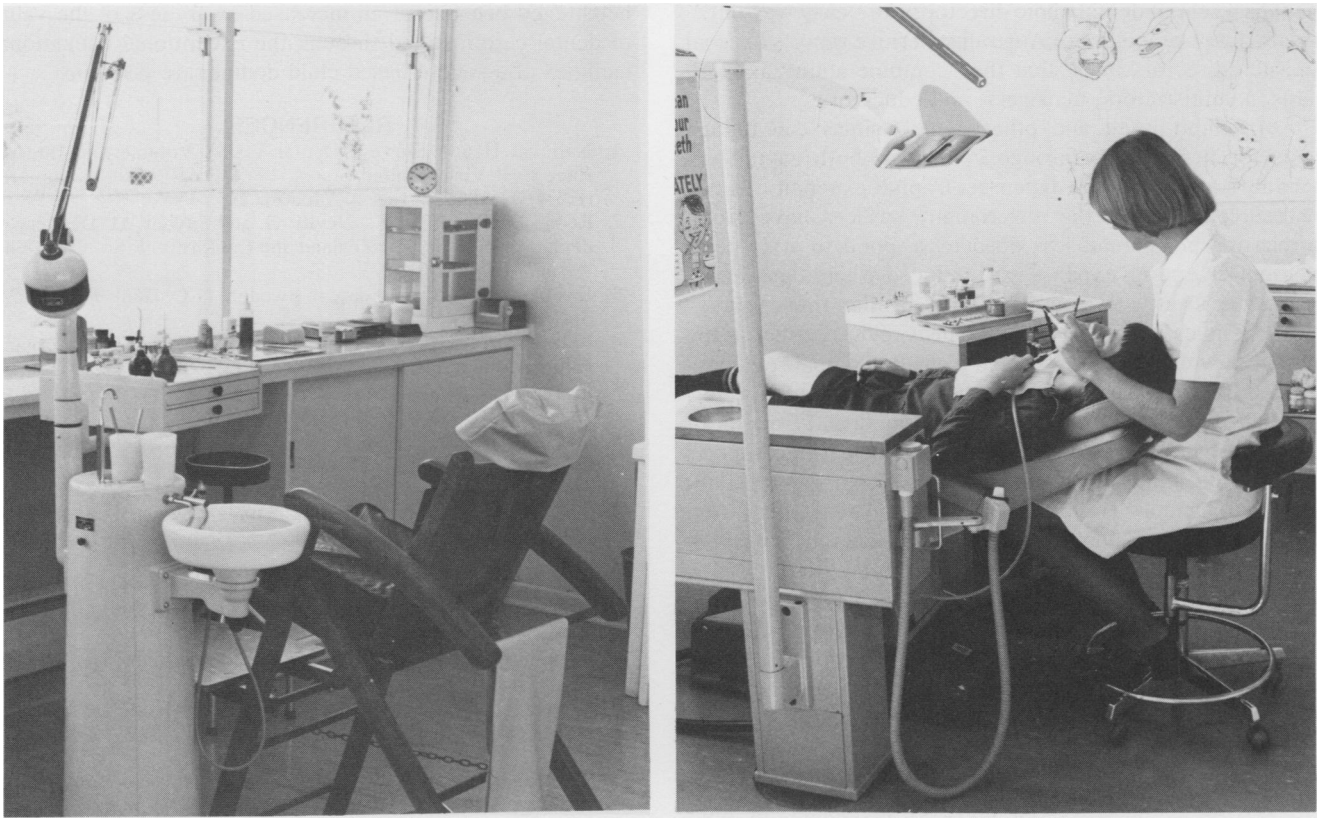
*Personal communication from R. K. Logan, op.cit.

‡Personal communication from H. D. Kennare, op. cit.

‡‡Personal communication from Paul R. Spang, J. J. Crimmings Co., Boston, January 10, 1978.

***Personal communication from P. B. V. Hunter, Principal Dental Officer, Research, New Zealand Department of Health, Wellington, May 31, 1977.

*Personal communication from R. K. Logan, op. cit.



The old and the new equipment in New Zealand. With primitive wooden chairs and low speed electric engines (left) the dental nurses brought good quality care to children over a 50 year period. Simple modern equipment (right) is now being provided from local designs at a cost far below that for the typical general dental office.

Discussion

The foregoing presentation suggests a listing of the advantages of school-based dental clinics, closely paralleling Dunning's similar list of the functions of all public clinics.[17]

1) The school-based clinics can bring comprehensive dental care including preventive measures to school children where they are gathered anyway for non-dental reasons in the largest possible numbers. This is particularly advantageous in dentist-deprived areas. A combination of education and health facilities is sensible both ideologically and logistically. Higher utilization of dental care services has been obtained by this method than by any other;

2) School-based dental clinics are less threatening to children than are private offices, since the children are in familiar surroundings. In addition, the children's daily contact with the therapist, in other roles, may have a lasting effect on their attitudes towards dentistry in general;

3) The location of dental clinics on school premises facilitates dental health education. Members of the dental health team can easily engage in classroom teaching, and then reinforce their messages by individual instruction at chairside;

4) By providing certain basic dental services at government expense, low-income people are more likely to be able to afford private dental care of a specialized nature when necessary. The value of public care, however, is greatest in the elementary school years and should give way to a mechanism by which patients can be shifted to private offices during the adolescent years for all phases of dental care. This will prepare young people for receipt of private care during adult life;

5) Because of the ease of carrying out routine dental inspection for entire student bodies on a regular basis, the demand for dental care is generally stimulated by a school-based clinic even above its capacity to render such care. This demand usually promotes increased referral to private practitioners;

6) School-based clinics provide an ideal setting for the use of expanded-duty dental auxiliaries, either of the American "reversible operations only" type or of the therapist or dental nurse types such as are found chiefly in Australia and New Zealand. Auxiliaries of these latter types have increased job satisfaction, which has consequently increased their career life;

7) School-based clinics give an opportunity for part-time or full-time employment of dentists at varying ages. Young dentists find such employment a good way to get started. Older dentists are often glad to maintain a connection with such clinics as a change of pace from private practice. In both instances, referrals from the school service to private practice may prove an advantage to the private practitioner. It must not be assumed from this that employ-

ment as a school dental clinic director is an "easy way out." The Director of the South Australian service reports his goal for such directors to be that they combine ability as clinicians, administrators, managers, and educators;

8) School-based and other dental clinics can reduce costs for dental care through control of both capital expenditure and operating expenses. Capital expenditures can be reduced because the government services have group purchasing power and less need to respond to style competition. Operating expenses are reduced where dental auxiliaries are used with a career life longer than three years;

9) Clinics in general facilitate peer review, either at the informal level or where instituted formally as a part of a government service. The former method is undoubtedly preferable. The latter, however, can be acceptable and a matter of real pride where properly organized. Soricelli[18] thus reports a review mechanism in the Philadelphia Department of Public Health Dental Service, where the faculty members from local dental schools have turned peer review into a well-accepted and efficient educational procedure;

10) School-based and other dental clinics, when associated with medical clinics, can facilitate valuable consultation on medico-dental problems.

It is only fair to state that school-based dental clinics do have certain disadvantages. One-chair clinics, so commonly seen in the older school dental programs of a generation ago, have proved inefficient for the same reasons that one-chair solo private dental offices have proved inefficient. In addition, the short school hours and the long school vacations have made full-time employment of personnel difficult in the United States, although Australia reports no such problem. These disadvantages can be overcome by concentrating, particularly in urban areas, upon fairly large clinics and efficient use of auxiliaries and by opening clinics to adults and pre-school children outside of school hours. In rural areas, it is possible to employ traveling dental personnel using clinic rooms where only the basic chair and dental unit are provided and the rest of the equipment is taken from place to place in portable cases. This method has been used successfully in the Saskatchewan, Canada, dental program,[19] and is being developed in the remote areas of the Labrador coast served by the International Grenfell Association.[20] In other areas as diverse as Baltimore, Maryland, and New South Wales, Australia, dental trailers ("caravans" in Australia) are used.

A final point needs to be made as to the interaction between school-based public dental services and private practice. Our main resource for dental care in the United States is, of course, the existing corps of private dental practitioners. It is obviously essential that these practitioners be kept fully employed, and therefore that the public services be located primarily where private care is inadequate. Whether school-based public dental care for children will become universal in years to come remains to be seen. This will be a satisfactory result only if private practitioners find themselves able to meet a larger proportion of the dental needs of adult populations than they do at present. The needs will almost certainly be there, in spite of good maintenance care during childhood, and the demand for care should have been heightened because of an increased awareness of the value of dental care instilled through the exceptional educational facilities of a school-based child dental care program.

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